

Remarks

Based on the foregoing amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

I. Status of the Claims

Upon entry of the foregoing amendment, claims 43, 44, 46-50, 52-57, 59-61, 63 and 64 are pending in the application, with 43 and 63 being the independent claims. These changes are believed to introduce no new matter, and their entry is respectfully requested.

II. Support for the Amended Claims

Support for the amendments to the claims may be found throughout the as-filed specification. In particular, support for the amendments to claim 63 finds may be found, *inter alia*, at page 14, lines 5-13 and in the claim 14 as filed. No new matter has been added by way of the present amendments.

III. Summary of the Office Action

In the Office Action dated December 3, 2003, the Examiner made one objection to and four rejections of the claims. Applicant respectfully offers the following remarks to overcome the objection and rejections.

IV. Objection to the Specification

At page 2, paragraph 2 of the Office Action, the Examiner objects to the specification, stating that the disclosure of the '884 application cannot be incorporated by reference into the instant application via an amendment submitted after filing. Applicant respectfully traverses the objection.

However, in order to expedite the allowance of the present application, Applicant has, by the foregoing amendment, deleted the phrase "the entire specification of which is specifically incorporated herein by reference" from the "Cross-Reference to Related Applications" section of the specification. Accordingly, the Examiner's objection has been accommodated, and withdrawal of the objection is respectfully requested.

V. Rejections Under 35 U.S.C. § 112, First Paragraph

A. The Rejection of Claims 43-49, 51-57, 59-61, 63 and 64 Under 35 U.S.C. § 112, First Paragraph for Lack of Written Description Must be Withdrawn

At page 3, paragraph 5 of the Office Action, the Examiner rejects claims 43-49, 51-57, 59-61, 63 and 64 for failing to comply with the written description requirement of § 112, first paragraph. The Examiner contends that claims 43 and 63 encompass compositions of a virtually limitless range of sizes, and that the specification fails to support such a range. Applicant respectfully disagrees with this contention.

The written description requirement of 35 U.S.C. § 112, first paragraph, is met if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an [applicant] had possession of the concept of what is claimed, *id.*, *i.e.*, "a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, even if every nuance of the

claims is not explicitly described in the specification" *In re Alton*, 37 USPQ2d 1578, 1584 (Fed. Cir. 1996). An applicant is not required to disclose or provide a working example of every species of a given genus in order to meet the written description requirement of 35 U.S.C. § 112 (*see Parks and Alton*), and subject matter that "might fairly be deduced from the original application" is considered to be described in the application as filed. *Acme Highway Products Corp. v. D.S. Brown Co.*, 431 F.2d 1074, 1080 (6th Cir. 1970) (citations omitted), *cert. denied*, 401 U.S. 956 (1971), *followed by Westphal v. Fawzi*, 666 F.2d 575, 577 (C.C.P.A. 1981). Moreover, "[a] description of a genus . . . may be achieved by means of recitation of a representative number of [species] . . . falling within the scope of the genus" *Regents of Univ. of Calif. v. Eli Lilly & Co.*, 119 F.3d 1559, 1569 (Fed. Cir. 1997).

Applicant asserts that the claimed invention is sufficiently described in the disclosure such as to reasonably convey to one skilled in the relevant art that Applicant had possession of the claimed invention at the time the application was filed. This is illustrated throughout the specification and the examples. In particular, Applicant provides extensive disclosure of DNA fragment sizes (see the paragraphs bridging pages 4-5 and 5-6, as well as pages 8-10 of the specification), various sources for the DNA (see pages 7, 8, 10, 12), as well as particular exemplified embodiments in the Examples. Hence, Applicant respectfully asserts that the present specification provides sufficient written description to convey to one of ordinary skill that Applicant had possession of the full scope of the claimed invention upon the filing of the application.

On page 4, paragraph 7 of the Office Action, the Examiner cites to the specification and alleges that "applicant fairly asserts that other embodiments may be obvious, and are indeed encompassed by the claims" Applicants are puzzled by this

statement as the quoted specification does *not* say that other embodiments may be obvious (although they certainly will be apparent to the skilled artisan upon review of applicants' disclosure). Nonetheless, Applicant does not rely on obviousness to fulfill the written description requirement because the specification provides a detailed description of the DNA ladders containing DNA fragments of any desired range.

Accordingly, claims 43-49, 51-57, 59-61, 63 and 64 are based upon an adequate written description. Withdrawal of the rejection is respectfully requested.

B. The Rejection of Claims 63 and 64 Under 35 U.S.C. § 112, First Paragraph For Lack of Written Description Must be Withdrawn

At page 5, paragraph 8 of the Office Action, the Examiner rejects claims 63 and 64 for failing to comply with the written description requirement of 35 U.S.C. § 112, first paragraph. The Examiner contends that the term "visibly brighter" in claim 63 encompasses virtually any value, and that the specification fails to describe claims of such scope. Applicant respectfully traverses this rejection.

However, in order to expedite the allowance of the present application, Applicant has, by the foregoing amendment, amended claim 63 to delete the term "visibly brighter." Accordingly, the Examiner's rejection has been accommodated, and withdrawal of the rejection is respectfully requested.

In view of the foregoing remarks, Applicant respectfully requests that the rejections under 35 U.S.C. § 112, first paragraph be reconsidered and withdrawn.

VI. Rejections Under 35 U.S.C. § 103

A. *The Rejection of Claims 43-56, 59-60, 63 and 64 Under 35 U.S.C. § 103(a) As Being Unpatentable Over the 1995-1996 Life Technologies Catalogue Must be Withdrawn*

At page 5, paragraph 11 of the Office Action, the Examiner rejects claims 43-56, 59-60, 63 and 64 under 35 U.S.C. § 103(a) as being unpatentable over the 1995-1996 Life Technologies Catalogue. The Examiner contends that it would have been obvious to one of ordinary skill in the art to have developed any of a variety of DNA ladders for use in an electrophoresis assay and to have adjusted the relative concentrations of the bands such that the intensities of any one or all of the bands was the same or more intense than others. Applicant respectfully traverses this rejection.

The Life Technologies Catalogue does not disclose compositions that consist essentially of bands of substantially the same intensity when separated by gel electrophoresis and stained. A careful examination of the DNA ladders on pages 14-2 through 14-4 of the Life Technologies Catalogue reveals bands of varying intensities within each ladder.

Applicant also directs the Examiner's attention to Figure 2 and pages 21-22 of Applicant's application. Figure 2 illustrates the differences between the invention and various commercially available DNA ladders when analyzed by gel electrophoresis. Lane 2 contains the 1 kb ladder that was described as available from Life Technologies. The fragments smaller than 1 kb appear less intense than the 1018 bp increment bands. This is because the relative mass of each of these fragments (and thus the intensity of these bands when stained) decreases in proportion to its size. Also note that the 1,636 bp and 500 bp bands stain more intensely than do other bands in the ladder.

These ladders in the Life Technologies Catalogue do not teach or suggest the ladders of the current invention, which consist essentially of bands of substantially equal intensity after the composition is separated by gel electrophoresis and stained with a detectable marker.

At page 8, paragraph 21 of the Office Action, the Examiner states:

[T]he claimed composition does not preclude the presence of bands of greater or lesser intensity. It is further noted that there need be only two bands that are of "substantially equal intensity" after the composition is separated by gel electrophoresis. Accordingly, there need be present only two bands that are of "substantially equal intensity." With the phrase "substantially equal intensity" not being defined, said phrase has been interpreted as allowing for significant variability between bands.

While it is true that the term "substantially equal intensity" is not specifically defined by the specification, the term "substantially equal relative mass" is defined by the specification. According to the specification, relative mass is substantially equal when the relative mass of each fragment is about the same to no more than 3 times the relative mass of another fragment (*see* Application at page 9). "By having substantially the same relative mass, the bands of the ladders or compositions of the invention have substantially equal intensity when staining after separation by gel electrophoresis" (*see* Application at page 5). Because the intensity of a band is directly proportional to its relative mass, it is clear that the term "substantially equal intensity" means that the fragment in question has no more than 3 times the intensity of another fragment. The Examiner has provided no proof that the ladders of the Life Technologies Catalogue contain bands that fall within these definitions, or that it would have been obvious to one of ordinary skill in the art, after reading the Life Technologies Catalogue, to have developed the claimed invention.

The DNA ladders of the Life Technologies Catalogue show bands of varying intensities that cannot be considered to be of "substantially equal intensity." This fact is demonstrated in Figure 2 of the present application. Lane 1 depicts a DNA ladder of the present invention, and lane 2 depicts a 1 Kb DNA Ladder that is commercially available from Life Technologies, Inc. The 1 Kb ladder differs from the invention in that the fragments smaller than 1 Kb appear less intense than the 1018 bp increment bands. This is because the relative mass of each of these fragments (and thus the intensity of these bands when stained) decreases in proportion to its size. Also, the 1,636 bp band and the 500 bp band stain more intensely than do other bands in the ladder (see Application at page 21, Figure 2 and 1995-1996 Life Technologies Catalog, page 14-4, 1 Kb DNA ladder). Therefore, the Life Technologies Catalogue cannot render obvious claims 43 and 63 and the claims dependent thereon.

At page 8, paragraph 22 of the Office Action, the Examiner states:

Assuming . . . that the prior art does not teach [the substantially equal intensity] limitation, . . . the prior art still would render the claimed invention obvious as the improvement, if there is any, would be the result of routine optimization, which cannot be a point of non-obviousness.

The claimed invention fills an unfulfilled need in the art. Specifically, "[n]one of the commercially available DNA ladders provide a range of standard fragment sizes wherein the electrophoretic bands of high molecular weight of 1 kilobase (kb) or larger and bands in the range of 100-500 bp, are sharply resolved and are equal or substantially equal in intensity so as to be able to size nucleic acid fragments of interest spanning a broad molecular weight range using one nucleic acid standard" (*see* Application at page 2). Thus, the claimed invention is not the result of routine optimization but is a substantial departure from the prior art and is not taught or suggested by the prior art.

Accordingly, claims 43-56, 59-60, 63 and 64 are not rendered obvious by the Life Technologies Catalogue. Withdrawal of the rejection is respectfully requested.

B. The Rejection of Claims 57 and 61 Under 35 U.S.C. § 103(a) As Being Unpatentable Over the 1995-1996 Life Technologies Catalogue in view of Lee Must Be Withdrawn.

At page 7, paragraph 15 of the Office Action, the Examiner rejects claims 57 and 61 under 35 U.S.C. § 103(a) as being unpatentable over the 1995-1996 Life Technologies Catalogue as applied to claims 43-56, 58-60 and 62, and further in view of U.S. Pat. No. 5,268,568 to Lee. The Examiner contends that it would have been obvious to one of ordinary skill in the art to have modified the DNA ladders of the Life Technologies Catalogue such that a dye comprising bromophenol blue was included, given its common usage in electrophoresis of DNA samples. The Examiner also contends that a kit comprising DNA ladders would have been an obvious commercial expedient requiring little, if any, additional effort on the part of the ordinary artisan. Applicant respectfully traverses this rejection.

In proceedings before the Patent and Trademark Office, the examiner bears the burden of establishing a *prima facie* case of obviousness based upon the prior art. *See In re Piasecki*, 223 USPQ 785, 787-88 (Fed. Cir. 1984). The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references in such a way as to produce the invention as claimed. *See In re Fine*, 5 USPQ2d 1596,1598 (Fed. Cir. 1988). What is needed is a reason, suggestion, or motivation in the prior art that would motivate one of ordinary skill to combine the cited references, and that would also suggest a reasonable

likelihood of success in making or using the claimed invention as a result of that combination. *See In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988). Absent such suggestion and motivation, the cited references may not be properly combined to render the claimed invention obvious. *See In re Fine*, 5 USPQ2d 1596,1598 (Fed. Cir. 1988). In the present case, the Examiner's burden has not been satisfied.

The Examiner has provided no evidence of a suggestion or motivation to combine the Life Technologies Catalogue and Lee. Thus, the Examiner has not met the burden required to establish a *prima facie* case of obviousness. Even if one skilled in the art were to combine the Life Technologies Catalogue and Lee, this would not give the invention of claims 57 and 61. As detailed above, the Life Technologies Catalogue fails to disclose or suggest "bands of substantially equal intensity," which is a required limitation of claims 57 and 61 based upon their dependence on claim 43. Lee does not cure this defect in the Life Technologies Catalogue. Therefore a key limitation in claims 57 and 61 is not taught or suggested by the combination of the Life Technologies Catalogue and Lee. Furthermore, because the claimed composition of the present application is non-obvious, the kit comprising the composition is also necessarily non-obvious.

In making this §103(a) rejection, it appears that the Examiner has used hindsight reconstruction to combine two unrelated and isolated disclosures to make the claimed invention appear obvious. As the Federal Circuit has held numerous times, a hindsight analysis such as that employed by the Examiner in the present case is impermissible - instead, the Examiner must show suggestions, explicit or otherwise, that would compel one of ordinary skill to combine the cited references in order to make and use the

claimed invention. *See, e.g., Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

The Examiner fails to point to an objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art that would lead that individual to combine the relevant teachings of the Life Technologies Catalogue and Lee in such a way as to produce the invention as claimed. This does not comport with the Federal Circuit's mandate that the Examiner show suggestions, explicit or otherwise, that would compel one of ordinary skill to combine the cited references in order to make and use the claimed invention. Thus, the Examiner's hindsight analysis is impermissible and cannot be used to establish a *prima facie* case of obviousness.

In view of the foregoing remarks, Applicant respectfully requests that the rejections under 35 U.S.C. § 103(a) over the Life Technologies Catalogue and Lee be reconsidered and withdrawn.

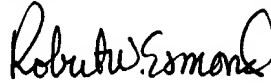
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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